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ABSTRACT

The paper proposes a conceptual framework with which to view employability of persons with severe disabilities. The central features of autonomy of adaptability in applied research programs in competitive employment are examined. Strategies to promote autonomy of performance are identified: self-control techniques, withdrawal of treatment components (sequential withdrawal, partial withdrawal, and partial-sequential-withdrawal), and traditional behavior change techniques. To promote adaptability of performance, studies are cited of the effects of general case programming. The importance of assessing the strategies alone and in combination is stressed. Three pages of references are included. (CL)

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Behavioral Training Strategies and Applied Research in Competitive Employment

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Running Head: Autonomy and Adaptability

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Behavioral Training Strategies and Applied Research in Competitive Employment

Significant advances have been made in expanding the concept of employability to include persons with severe disabilities (Bates & Pancsofar, in press; Mithaug, 1981; Schutz & Rusch, 1982; Rusch & Mithaug, 1980; Rusch, 1983; Rusch & Schutz, 1981; Wehman, 1981). These advances have resulted from improvements in training technology, litigation and legislation, and identification of variables associated with successful community adjustment. Furthermore, the analysis of reasons why mentally retarded individuals lose their jobs, and the identification of skills and behaviors considered critical for successful competitive employment have enabled staff associated with competitive employment programs to work toward more clearly defined objectives. Despite these advances, placement and retention rates of employees with mental retardation is below 50 per cent, with workers often displaying inadequate maintenance and generalization of trained behaviors. These issues have only recently been addressed in a systematic fashion within competitive employment settings. As empirical research is pursued in the areas of maintenance and generalization, it becomes even more important to develop a conceptual framework to unify these findings and to guide future investigations. The present paper proposes such a framework and identifies behavioral training strategies that can comprise a systematic technology for vocational training.

Introduction to Autonomy and Adaptability

The goals of applied research programs in competitive employment can be considered along two dimensions, autonomy and adaptability of performance. Autonomy refers to the ability of an employee to perform vocational skills correctly with minimal supervision (i.e., maintenance skills). Adaptability refers to the ability of an employee to perform vocational skills correctly across a range of environmental contexts and task requirements (i.e., generalized skills). Table 1 displays hypothetical employee profiles along these two dimensions. Mark represents a profile that is the objective of vocational training: maximal autonomy and adaptability. That is, Mark remains on task without supervision and exhibits high skill transfer. Joe displays a deficit in adaptability (i.e., little skill transfer), Sara a deficit in autonomy (i.e., needs maximum supervision), and Tom deficits in both autonomy and adaptability.

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Insert Table 1 about here

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Gifford, Rusch, Martin, and White (in press) have discussed several strategies that can serve to focus applied research in employment settings to promote autonomy and adaptability of work behavior. These strategies are summarized in Table 2, and discussed more fully in subsequent sections of this paper.

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Insert Table 2 about here

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Autonomy

An employee's autonomy is a crucial factor in job retention. Typically, an employee must be able to work independently with minimal supervision. Several strategies can be used to promote working independently. These strategies include: (a) self-control training techniques, (b) systematic procedures for the withdrawal and reinstatement of treatment components, and (c) traditional behavior-change strategies. Examples of these strategies and their contributions toward facilitating autonomy are discussed below.

Self-control training techniques. Self-control refers to an individual's own attempts to modifying his or her own specific behavior. After an examination of the self-control literature, Rusch, Martin, and White (in press) determined that antecedent cue regulation, self- monitoring, and self-reinforcement strategies were especially useful self control training techniques. Antecedent cue regulation limits the range of discriminative stimuli controlling the desired behavior, and has incorporated procedures such as the use of picture cues (Connis, 1979; Martin, Rusch, James, Decker, & Trtol, 1982; Wacker & Berg, 1983). For example, if a male employee is responsible for "setting-up" a section of tables in a restaurant (e.g., making sure that napkins and salt and pepper shakers are on the tables), and uses a book with pictures of these items as a way to select the appropriate items from a vast array of other restaurant paraphenalia, then that employee would be using antecedent cues--the pictures--to regulate performance. If that same employee "set-up" the tables, and evaluated the completeness of his task, the employee would be using self-monitoring procedures. Thus, self-monitoring refers to initial awareness of the occurrence or nonoccurrence of a behavior, followed by

the recording or reporting of that behavior (Nelson, 1977; Shapiro, 1981). Finally, self-reinforcement involves the self-determination and self-administration of reinforcement (Jones, Nelson, & Kazdin, 1977). So, if the employee realized that he or she had completed the task satisfactorily, and had given himself a token, then the employee would be using self-reinforcement techniques.

It is quite likely that mentally retarded employees who attend to antecedent cues, evaluate and report their own behavior, and manage self-rewards will be able to function more autonomously. Thus, the use of antecedent cue regulation, self-monitoring, and self-reinforcement strategies appear promising to promote the maintenance of independent vocational behavior.

Withdrawal of treatment components. Rusch and Kazdin (1981) proposed three strategies for withdrawing training components after work behavior has been taught so as to facilitate autonomy: (a) sequential-withdrawal; (b) partial-withdrawal; and (c) partial-sequential-withdrawal. A sequential-withdrawal strategy consists of the gradual withdrawal of selected components of a training package in consecutive treatment phases to determine if behavior is maintained. If, during any phase, performance decreases below acceptable levels, a treatment component (or all of the components) is replaced; when the behavior is built back to an acceptable level, a different order of withdrawal is instigated. Rusch, Connis, and Sowers' (1978) study exemplifies the use of the sequential-withdrawal strategy. In their study, prompts and praise, tokens, and response cost comprised the treatment package used to increase the subject's time--spent working in a restaurant setting. Once the subject learned to be attentive, a sequential-withdrawal of each of the individual components was initiated.

First, response cost contingencies were no longer in effect each day; rather, they were in effect only on predetermined, randomly selected days. Second, a four-step withdrawal of the token economy was initiated. In a final phase, praise was withdrawn. Within each withdrawal phase no loss in acquired behavior was noted.

The partial-withdrawal strategy consists of withdrawing a component of the intervention package or the total package from one of several different behaviors, persons, or settings. Utilizing this strategy, the intervention is gradually withdrawn across different behaviors, persons, or settings. If withdrawing the intervention does not result in loss of the desired behavior, then the intervention is withdrawn from a second behavior, person, or setting as well. If the withdrawal results in loss, the component(s) are replaced; following reinstatement to original performance levels, different withdrawal procedures are attempted to obtain individual autonomy.

Vogelsberg and Rusch's (1979) study demonstrates the value of the partial-withdrawal strategy in identifying potential failures before they occur. In their investigation, three severely mentally retarded adolescents were trained to cross intersections. When feedback, which was one of the training components was withdrawn from one of the students, "approaching," "stepping," and "walking" was maintained. However, a critical feature of crossing the intersections--"looking"--decreased in frequency. These data suggested that a loss in "looking" might have resulted for all students if a similar withdrawal were introduced for each. Therefore, Vogelsberg and Rusch introduced a different training strategy with the two remaining students. Behavioral rehearsal and a trainer model resulted in independent performance of the criterion behaviors. In addition, this

revised strategy was applied to the first student after he was taught to "look" at directions before crossing. With the partial-withdrawal strategy, either a single component, several, or all components of a training package are withdrawn from one behavior, person, or setting multiple-baseline design.

Lastly, the partial-sequential-withdrawal strategy, combines the two previous strategies. First, all or part of a treatment package is withdrawn from one of the behaviors, persons, or settings. If the behavior maintains, the withdrawal is advanced to include other components, or replicated across other behaviors, persons, or settings. If the behaviors do not maintain, however, the withdrawn components is reintroduced to the target employee, with the withdrawal of the same or different components applied to one or more of the remaining behaviors, persons, or settings. "Combining the partial and sequential-withdrawal (strategy) allows for the orderly withdrawal of the various components of the treatment package in an effort to decrease the probability that (employees) will discriminate the absence or presence of the contingencies. By combining the partial and sequential-withdrawal strategies (placement coordinators) can predict, with increasing probability, the extent to which they are controlling the treatment environment as the progression of withdrawals is extended to other behaviors, subjects, or settings" (Rusch & Kazdin, 1981, p. 136).

Martin et al. (1982) assessment of independent meal preparation through the use of pictorial cues (antecedent cues) incorporated a partial-sequential- withdrawal strategy. Instructional feedback and pre-instruction were included in the treatment package for the three adults in this study who were competitively employed. Following acquisition by the first person, instructional feedback was withdrawn, followed by pre-

instruction. Each withdrawal was so successful that a more rapid withdrawal strategy was undertaken with the second adult. Simultaneous withdrawal of both instructional feedback and pre-instruction resulted in a minimal loss of autonomous performance. A similarly rapid withdrawal strategy was then utilized with the third adult. Interestingly, not only did performance maintain, in some instances it improved due in part to the reduction in behavioral outbursts triggered by trainer feedback.

These examples indicate that the systematic withdrawal and assessment of treatment components can be used to maintain work behavior. Although further research is warranted in this area, the application of these strategies (i.e., sequential-withdrawal, partial-withdrawal, and partial-sequential withdrawal) have the potential for enabling mentally retarded employees to function more independently.

Traditional behavior-change strategies. In addition to the self-control and component-withdrawal procedures just discussed, several traditional behavior-change strategies have proven effective in promoting autonomy. Essentially, these strategies have as their common aim the minimization of differences between the training setting and the target placement environment in which the employee is ultimately going to need to be independent. A basic strategy is simply to design the training setting as similar as possible to the target environment in which the behavior is to endure (O'Leary & O'Leary, 1976). A slight variant involves making gradual transitions in the training task until it is equivalent to the target task in the natural environment. These transitions have taken place with respect to reinforcement schedules (Rusch et al., 1978).

Another method of achieving congruence between the training and the placement settings is to engineer the placement setting. For example,

reinforcers delivered by placement coordinators in the training setting can be applied by coworkers in the natural environment (Stokes & Baer, 1977), preserving the basic training procedure. Still another tactic that prepares the employee for transition from the training setting to the placement setting is rehearsal in the placement setting prior to termination of the training program.

Summary. One of the dimensions along which the goals of competitive employment programs can be considered is autonomy of performance. It is critical that mentally retarded employees be able to perform with minimal supervision. Several strategies have been suggested as training techniques to promote independent performance. One strategy discussed was self-control training techniques including antecedent cue regulation, self-monitoring, and self-reinforcement. The other two strategies suggested were withdrawal of treatment components utilizing sequential-withdrawal, partial-withdrawal, and partial-sequential-withdrawals, and traditional behavior-change techniques, which seek to minimize the differences between the training setting and placement setting.

Adaptability

Employees must not only perform work behavior correctly with minimal supervision, but they must also be able to function relatively independently across a wide range of environmental contexts and response requirements. Although several conceptualizations have been suggested at the theoretical level to promote generalization of skills, general case programming represents the most applied approach to date (Horner, Sprague, and Wilcox, 1982).

General Case Programming. As characterized by Horner and his colleagues, general case programming represents work behavior performed by a trainer to increase the probability that certain behavior learned in one training setting will be successfully performed with different target stimuli, and/or in different settings, from those used in training. General case programming consists of a systematic process of defining the instructional universe, selecting appropriate examples from that universe, and properly sequencing the examples to promote generalization of performance across varied target settings. Concepts central to general case programming are stimulus class and response class. A stimulus class refers to any group of stimuli that share a common set of stimulus characteristics. For example, when selecting a dinner plate in a restaurant, an employee is to obtain an instance of the stimulus class of "dinner plate." All stimuli that do not fit within the "dinner plate" stimulus class (e.g., saucers, salad plates) are outside the stimulus class. A response class is defined using similar criteria. The primary factors determining a class of responses are that all instances of the class produce the same outcome and that all members of the class share common topographical characteristics (Horner et al., 1982). For example, the response class "using a screwdriver to tighten a screw" is defined by a previously loose screw being tight and by the response topography required to achieve the outcome of a tightened screw using a screwdriver. General case learning is achieved when a given stimulus class exhibits stimulus control over a given response class, i.e., any member of the stimulus class controls the appropriate member in the response class. Several considerations guide defining the instructional universe, selecting examples from that universe, and sequencing the examples. These include providing sufficient variation within stimuli and

response requirements so as not to train too narrowly. Control by irrelevant stimuli is reduced, and control by relevant stimuli is accentuated so that stimulus control is maximal.

Recently, Horner and McDonald (1982) compared single instance instruction to general case instruction in teaching four severely mentally retarded high school students the vocational skill of crimping and cutting electronic capacitors. In this study, Student A was provided single instance instruction first, followed by Students B, C, and D, respectively. During general case instruction, the order was reversed, with Student D being the first to receive general case instruction. During each of the instructional phases, probes were conducted on 20 capacitors on which students had received no instruction. The results indicated that general case instruction could be utilized successfully to teach crimping and cutting of electronic capacitors as a functional vocational skill and that general case instruction was superior to single instance instruction for promoting adaptability.

Summary. The results of the Horner and McDonald (1982) study suggest the value of proper selection and sequencing of training examples to develop behavior change that is enduring and functional across varying environments. By promoting generalization across tasks, settings, supervisors, and other environmental factors, employees with mental retardation will be more adaptive because each situational variation will not require additional training. The general case approach is likely to be a powerful technique that can be used to increase the probability of generalized responses by mentally retarded workers.

Overview of the Proposed Framework

In this paper, the concepts of autonomy and adaptability have been proposed as a framework from which to consider employee behavior. That is, employees must not only be able to perform work behavior with minimal supervision (i.e., be autonomous), but they must also be able to perform vocational skills correctly across a range of environmental contexts and task requirements (i.e., be adaptable). Thus far, strategies have been proposed to facilitate either autonomy or adaptability of performance, but not both. This does not suggest, however, that strategies that facilitate autonomy and adaptability should not be used together. A study conducted by Wacker and Berg (1983) suggests this broader overall strategy. In this study, several strategies to promote autonomy of performance were combined with a generalization strategy. Five moderately and severely mentally retarded adolescents were first taught to use picture cues to guide their performance on complex assembly and packaging tasks. This was followed by training on two of the tasks themselves, using picture cue guidance (an antecedent cue regulation strategy). During training, modeling, verbal correction, and contingent praise were delivered. Following training, both autonomy and adaptability were assessed. In the first phase, students were assessed on training tasks using picture prompts, but with modeling, verbal correction and contingent praise withdrawn. In a second phase the students were assessed with the picture cues withdrawn as well. A third post- test phase, designated maintenance by Wacker and Berg, assessed students under the same conditions as Post-test 2, but two to four weeks later. Generalization testing was conducted by presenting novel tasks under the same conditions as subjects received in Post-test 1 and Post-test 2. Results indicated that picture prompts can

be used successfully to promote acquisition, maintenance, and generalization of complex vocational tasks.

Although Wacker and Berg's study is interesting in its own right, it is presented primarily to demonstrate the manner in which strategies for facilitation of autonomy and adaptability can be combined. Wacker and Berg utilized three strategies that promote primarily autonomy of performance: traditional behavior-change strategies, antecedent cue regulation, and sequential withdrawal of the treatment package. The use of picture cues can be considered a traditional behavior-change strategy; the fact that the subjects learned to manage the picture cues themselves constitutes antecedent cue regulation; and the withdrawal of modeling, verbal correction, contingent praise, and the picture cues at different assessment points comprises a form of the sequential withdrawal strategy.

Additionally, Wacker and Berg attempted to facilitate adaptability of behavior by presenting training procedures that could be considered a rudimentary form of general case programming. In their training procedure, two different vocational tasks (e.g., valve assembly and circuit board assembly) were presented and their subsequent effect upon maintenance and generalization was assessed. By presenting multiple training examples, the authors promoted adaptability of performance. Thus, Wacker and Berg's study uniquely illustrates the use of multiple strategies to promote both autonomy and adaptability.

Conclusion

The complexity of the training and testing procedures found in Wacker and Berg's study suggests the value of a conceptual framework to guide and evaluate research on the maintenance (autonomy) and generalization (adaptability) of behavior. The framework presented in this paper

considers procedures utilizing self- control, withdrawal of treatment components, and traditional behavior- change techniques as strategies primarily promoting autonomy of performance. General case programming was cited as a strategy promoting adaptability of performance. To develop a truly effective technology for promoting autonomy and adaptability of work performance, each of the strategies suggested must be assessed alone, and more importantly, in combination. An employee that displays both autonomous and adaptable behavior will very likely be successful in competitive employment settings.

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Table 1.

Worker Profiles Along the Dimensions of Autonomy and Adaptability.

	Minimal	Maximal
	Adaptability	
	Tom	Sara
Minimal	(1) Remains on task only with supervision (2) Transfers to new tasks with difficulty	(1) Remains on task only with supervision (2) Transfers to new tasks easily
AUTONOMY	Joe	Mark
Maximal	(1) Remains on task without supervision (2) Transfers to new with difficulty	(1) Remains on task without supervision (2) Transfer to new tasks easily

Table 2.

Strategies Utilized Within Vocational Training Studies That Promote Worker Independence (Autonomy) and Performance (Adaptability).

Autonomy	Adaptability
Self-control Strategies · antecedent cue regulation · self-monitoring · self-reinforcement	General Case Programming
Withdrawal Strategies · sequential withdrawal · partial withdrawal · partial-sequential withdrawal	
Traditional Strategies · minimization of differences · engineering the natural environment · rehearsal in the natural environment	